

FORM PTO-1390
(Rev 5-93)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

ZAHFRI P396US

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.55)
10/031358

INTERNATIONAL APPLICATION NO.

PCT/EP00/06764

INTERNATIONAL FILING DATE

July 15, 2000

PRIORITY DATE CLAIMED

July 23, 1999

TITLE OF INVENTION

ELECTRODYNAMIC DRIVE TRAIN

APPLICANT(S) FOR DO/EO/US

Friedrich J. EHRLINGER

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
 2. ☐ This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
 3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
 4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
 5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau. (PCT/IB/308 mailed **01 February 2001**).
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
 6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)) is attached.
 7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
 8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
 9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
 10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).
- Items 11. to 16. below concern other document(s) or information included:**
11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98 with PTO FORM 1449.
 12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
 13. ☒ A FIRST preliminary amendment w/Marked-Up Version of Amended Specification.
☐ A SECOND or SUBSEQUENT preliminary amendment.
 14. ☐ A substitute specification.
 15. ☐ A change of power of attorney and/or address letter.
 16. ☒ Other items or information:

<input checked="" type="checkbox"/> Preliminary Examination Report	<input checked="" type="checkbox"/> Copy of Request
<input checked="" type="checkbox"/> Annexes to Pre. Ex. Rep.	<input checked="" type="checkbox"/> Submission of Formal Drawings
<input checked="" type="checkbox"/> International Search Report	<input checked="" type="checkbox"/> <u>3</u> sheets of formal drawings
<input checked="" type="checkbox"/> German Novelty Search Report	<input checked="" type="checkbox"/> Abstract
<input checked="" type="checkbox"/> <u>10</u> copies of citations	<input checked="" type="checkbox"/> German Language Specification
<input checked="" type="checkbox"/> Form PCT/IB/308	<input type="checkbox"/>
<input checked="" type="checkbox"/> International Publ. No. WO 01/07278 A1 (Face page only)	

CERTIFICATION UNDER 37 CFR 1.10

I hereby certify that this Transmittal Letter and the papers indicated as being transmitted therewith is being deposited with the United States Postal Service on this date **January 17, 2002** in an envelope as "Express Mail Post Office to Addressee" Mailing Label Number **EL 918841561US** addressed to the: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Anthony G. M. Davis

(typed or printed name of person mailing paper)

(signature of person mailing paper)

PATENT & TRADEMARK OFFICE



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17. ■ The following fees are submitted:

Basic National Fee (37 CFR 1.492(a)(1)-(5)):

Search Report has been prepared by the EPO or JPO \$890.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) \$710.00

No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)). \$740.00

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$1040.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =

CALCULATIONS

PTO USE ONLY

JC13 Rec'd PCT/PTO 17 JAN 2002

890

0

Claims

Number Filed

Number Extra

Rate

Total Claims

11 - 20 =

0

x \$18.00

0

Independent Claims

1 - 3 =

0

x \$84.00

0

Multiple dependent claim(s) (if applicable)

+ \$280.00

0

TOTAL OF ABOVE CALCULATIONS =

0

Reduction by 1/2 for filing by small entity, if applicable. **Applicant claims Small Entity Status.** (Note 37 CFR 1.9, 1.27, 1.28).

0

SUBTOTAL =

890

Processing fee of \$130.00 for furnishing the English translation later the ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)).

+

0

TOTAL NATIONAL FEE =

0

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property

+

40

TOTAL FEES ENCLOSED =

930

Amount to be:
refunded

\$

charged

\$

a. ■ A check in the amount of \$ 930.00 to cover the above fees is enclosed.b. ☐ Please charge my Deposit Account No. 04-0213 in the amount of \$_____ to cover the above fees.
A duplicate copy of this sheet is enclosed.c. ■ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 04-0213. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Anthony G.M. Davis
Anthony G.M. Davis - Registration No. 27,868
Davis & Bujold, P.L.L.C.
Fourth Floor
500 North Commercial Street
Manchester, NH 03101-1151
Telephone (603) 624-9220
Telefax (603) 624-9229

PATENT & TRADEMARK OFFICE



020210

01/17/02

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Friedrich J. EHRLINGER
Serial no. :
For : ELECTRODYNAMIC DRIVE TRAIN
Docket : ZAHFRI P396US

BOX PCT

The Commissioner of Patents and Trademarks
Washington, D.C. 20231

FIRST PRELIMINARY AMENDMENT

Dear Sir:

By way of preliminary amendment, please amend the above identified application as set forth below.

In the Specification:

Please cancel paragraphs 2, 3, 4, 7, 8, 13, 14, and 20 of the specification, in their entirety, in favor of a clean form of paragraphs 2, 3, 4, 8, 13, 14, and 20 of the specification, without any markings thereon, as follows. Accompanying this response is a copy of the original paragraphs of the specification which show the addition(s) (by underlining, shading and bold) and the deletion(s) (by strikeout) to the canceled specification paragraphs. Please enter the replacement specification paragraphs into the record of this case.

In the Claims:

Please cancel claims 1-12, without prejudice or disclaimer of the subject matter therein, in favor of new claims 13-23 as follows.

[002] FIELD OF THE INVENTION

[003] The invention concerns an electrodynamic drive train system for a vehicle.

[004] BACKGROUND OF THE INVENTION

[008] SUMMARY OF THE INVENTION

[013] BRIEF DESCRIPTION OF THE DRAWINGS

[014] The invention will now be described, by way of example, with reference to the accompanying drawings in which:

[020] DETAILED DESCRIPTION OF THE INVENTION

13. (NEW) An electrodynamic drive system (2) for a vehicle located between a drive source (4) and a manual transmission (16), having a planetary gear drive (12), which includes sun gear (50), internal gear (10) planetary gear (36) and planetary gear carrier (32), of which the planetary carrier (32) is connected to the manual transmission (16), the internal gear (10) is connected to the drive source (4) and the sun gear (50) is bound to at least one electric motor (22), with a shift clutch (40) between the planetary gear carrier and the sun gear (50) operable to bypass the planetary drive (12).

14. (NEW) The electrodynamic drive system (2) for a vehicle according to claim 13, wherein a blocking device is provided for torque reinforcement during starting of the drive source (4).

15. (NEW) The electrodynamic drive system (2) for a vehicle according to claim 14, wherein the blocking device as in the manual transmission (16) and is formed by the simultaneous engagement of two gear stages.

16. (NEW) The electrodynamic drive system (2) for a vehicle according to claim 14, wherein the blocking device is a parking lock.

17. (NEW) The electrodynamic drive system (2) for a vehicle according to claim 14, wherein the blocking device is a braking apparatus of the vehicle and a simultaneously engaged gear stage of the shifting clutch (40).

18. (NEW) The electrodynamic drive system (2) for a vehicle according to claim 14, wherein the blocking device is formed by an override clutch (59) on an input shaft (28) of the manual transmission (16).

19. (NEW) The electrodynamic drive system (2) for a vehicle according to claim 13, wherein between the drive source (4) and the electrodynamic drive system (2) an overrunning clutch (58) is provided.

20. (NEW) The electrodynamic drive system (2) for a vehicle according to claim 1 wherein an eddy current brake retard (56) is placed on a shaft (42) of the planetary drive (12).

21. (NEW) The electrodynamic drive system (2) for a vehicle according to claim 13, wherein a plurality of electric motors (22) on the sun gear (50) act upon the planetary drive (12).

22. (NEW) The electrodynamic drive system (2) for a vehicle according to claim 13, wherein the shift clutch (40) includes a dog clutch.

23. (NEW) The electrodynamic drive system (2) for a vehicle according to claim 13, wherein a control is provided, which can regulate the at least one electric motor (22) in 4-quadrant operation.

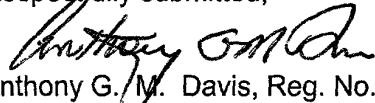
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REMARKS

Accompanying this response, please find marked-up paragraphs of the specification which overcome some informalities noted in the specification. The undersigned avers that the enclosed replacement paragraph(s) of the specification do not contain any new matter.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,



Anthony G. M. Davis, Reg. No. 27,868

Customer No. 020210

Davis & Bujold, P.L.L.C.

Fourth Floor

500 North Commercial Street

Manchester NH 03101-1151

Telephone 603-624-9220

Facsimile 603-624-9229

E-mail: patent@davisandbujold.com

10034358-044700

[001] ELECTRODYNAMIC DRIVE SYSTEM

[002] **FIELD OF THE INVENTION**

[003] —The invention concerns an electrodynamic drive train system for a vehicle in accord with the concept of Claim 1.

[004] **BACKGROUND OF THE INVENTION**

[005] Drive systems for vehicles customarily comprise an internal combustion motor as the driving machine, a subsequent manual transmission and a friction clutch placed between the internal combustion motor and the transmission or again, comprise a hydrodynamic converter placed between the internal combustion motor and the transmission. The friction clutch or the converter are burdened with losses and present energy losses in the drive train.

[006] The invention has the purpose of minimizing the losses which occur between the driving machine and the manual transmission.

[007] ~~This purpose is achieved by a drive system with the features of Claim 1. Embodiments of the invention are the objects of subordinate claims.~~

[008] **SUMMARY OF THE INVENTION**

[009] In accord with the invention, and with an electrodynamic drive system for a vehicle, it is proposed to place a planetary gear drive between a driving machine and a manual transmission, which said planetary gear drive encompasses the three elements, sun gear, internal gear, and planetary carrier. Of these three elements, a first element is connected to the manual transmission, a second element is bound to the driving machine, and a third element is coupled with at least one electric motor. An advantageous construction possesses a control, which can regulate the at least one electric motor in the 4-quadrant operation. A further embodiment possesses a clutch between two elements of the planetary drive for the lockup or bypass of the planetary drive, which in one type of assembly includes a dog clutch. In an additional arrangement, an overtake-free wheeling device is placed between the driving machine and the electrodynamic drive system. In yet another embodiment, several electric motors in combination act upon one of the elements of the planetary drive. In an advantageous embodiment, a lock-up torque

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- at least one electric motor, which can operate both as a drive motor as well as a generator,
- if required, a shifting clutch for bypassing the electric motor, when it need not be required as a motor,
- as well as the output shaft to the manual transmission and
- in some cases, a retarder.

[012] In comparison to conventional drive systems, the following can be eliminated:

- a dry clutch with disengagement means,
- a starter,
- a generator (light machine),
- in some cases, mechanical auxiliary power take-offs,
- partially, one or more mechanical gear stages, because the electrodynamic drive system introduces a corresponding increase of torque.\

[013] **BRIEF DESCRIPTION OF THE DRAWINGS**

[014] The invention, in the following, is explained in greater detail with the aid of the drawing. There is shown in: **will now be described, by way of example, with reference to the accompanying drawings in which:**

[015] Fig. 1 is a sketch of the principles of the invention;

[016] Fig. 2 is an embodiment in accord with Fig. 1 with brake retard system;

[017] Fig. 3 is an embodiment in accord with Fig. 1 with overrunning clutch;

[018] Fig. 4 is an embodiment in accord with Fig. 3 with a retarding brake system; and

[019] Fig. 5 is an embodiment in accord with Fig. 4 with additional overrunning clutch.

[020] **DETAILED DESCRIPTION OF THE INVENTION**

[021] Fig. 1 presents a sketch of the principles of the invented drive system 2. At the output of a drive machine 4, a flywheel 6 is installed, which, by means of a

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Friedrich J. EHRLINGER
Serial no. :
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BOX PCT

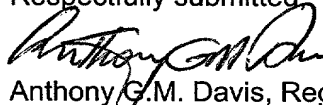
The Commissioner of Patents and Trademarks
Washington, D.C. 20231

SUBMISSION OF FORMAL DRAWINGS

Further to the filing of this application, enclosed please find three (3) sheets of formal drawings which are to be entered in this case.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted



Anthony G.M. Davis, Reg. No. 27,868

Customer No. 020210

Davis & Bujold, P.L.L.C.

Fourth Floor

500 North Commercial Street

Manchester NH 03101-1151

Telephone 603-624-9220

Facsimile 603-624-9229

E-mail: patent@davisandbujold.com

603-624-9220

[001] ELECTRODYNAMIC DRIVE SYSTEM

[002]

[003] The invention concerns an electrodynamic drive train system for a vehicle in accord with the concept of Claim 1.

[004]

[005] Drive systems for vehicles customarily comprise an internal combustion motor as the driving machine, a subsequent manual transmission and a friction clutch placed between the internal combustion motor and the transmission or again, comprise a hydrodynamic converter placed between the internal combustion motor and the transmission. The friction clutch or the converter are burdened with losses and present energy losses in the drive train.

[006] The invention has the purpose of minimizing the losses which occur between the driving machine and the manual transmission.

[007] This purpose is achieved by a drive system with the features of Claim 1. Embodiments of the invention are the objects of subordinate claims.

[008]

[009] In accord with the invention, and with an electrodynamic drive system for a vehicle, it is proposed to place a planetary gear drive between a driving machine and a manual transmission, which said planetary gear drive encompasses the three elements, sun gear, internal gear, and planetary carrier. Of these three elements, a first element is connected to the manual transmission, a second element is bound to the driving machine, and a third element is coupled with at least one electric motor. An advantageous construction possesses a control, which can regulate the at least one electric motor in the 4-quadrant operation. A further embodiment possesses a clutch between two elements of the planetary drive for the lockup or bypass of the planetary drive, which in one type of assembly includes a dog clutch. In an additional arrangement, an overtake-free wheeling device is placed between the driving machine and the electrodynamic drive system. In yet another embodiment, several electric motors in combination act upon one of the elements of the planetary drive. In an advantageous embodiment, a lock-up torque

converter is provided for the formation of torque support during the startup procedure. This can be carried out by the simultaneous engagement of two shifting stages in the manual transmission, by means of a parking lock, by a braking apparatus of the vehicle and a simultaneously engaged gear stage on an input shaft of the manual transmission. In one embodiment form, on one shaft of the planetary drive a brake retard is placed.

[010] By means of the invented drive system, a more environmentally friendly functioning of the vehicle and a lowering of the operating life costs are attained. With the present invention, a drive system is presented, which avoids any friction based starting element. What otherwise would be power lost in slippage, can be now used as a additional power for the electrical on-board system. At the same time, use of the electric motor permits an increase of torque and the motor can be employed as a booster element in the concept of additional drive, during an accelerating period. After the startup phase, the electric motor can be converted to a generator for on-board current supply. The electric motor, in addition, can be employed as a source of power for electrically driven, ancillary power take offs. The use of the electric motor as a starter for the internal combustion motor and as a vehicle drive without the exhaust of environmentally unfriendly substances is a growing technology. At the same time, with corresponding control, as well as in connection with an additional retarding braking system, such as, for example, a hydrodynamic retarder, a damping of interruptions in the drive train can be achieved.

[011] The planetary gear set proposed for the invented drive system can be inserted in front of an optional manual transmission. The following are connected to members of the planetary gear drive:

- the input shaft from the internal combustion motor, if required, with overrunning clutch for start-stop operation or for the Zero-Emission-Vehicle-operation, that is, powering the vehicle by the electric motor, when the internal combustion motor is not turning,
- at least one electric motor, which can operate both as a drive motor as well as a generator,

- if required, a shifting clutch for bypassing the electric motor, when it need not be required as a motor,
- as well as the output shaft to the manual transmission and
- in some cases, a retarder.

[001] In comparison to conventional drive systems, the following can be eliminated:

- a dry clutch with disengagement means,
- a starter,
- a generator (light machine),
- in some cases, mechanical auxiliary power take-offs,
- partially, one or more mechanical gear stages, because the electrodynamic drive system introduces a corresponding increase of torque.\

[002]

[003] The invention, in the following, is explained in greater detail with the aid of the drawing. There is shown in:

[004] Fig. 1 a sketch of the principles of the invention;

[005] Fig. 2 an embodiment in accord with Fig. 1 with brake retard system;

[006] Fig. 3 an embodiment in accord with Fig. 1 with overrunning clutch;

[007] Fig. 4 an embodiment in accord with Fig. 3 with a retarding brake system;

and

[008] Fig. 5 an embodiment in accord with Fig. 4 with additional overrunning clutch.

[009]

[010] Fig. 1 presents a sketch of the principles of the invented drive system 2. At the output of a drive source 4, a flywheel 6 is installed, which, by means of a shaft 8, is connected with the internal gear 10 of the planetary gear drive 12. The planetary drive 12 is placed in a part 18 of the housing 14 of a manual transmission 16. In an additional part 20 of the housing 14, an electric motor 22 is provided. Within yet another part 24 of the housing 14 are located the known

elements of a manual transmission 16, in regard to which, no further discussion is necessary. The parts 18, 20, and 24 can also be separate housing elements combined into an entire housing 14. The shaft 8 is in the part 20 of the housing 14 and rotatably secured in bearings 26. The input shaft 28 of the manual transmission 16 is likewise rotatably secured in bearings 30 and is affixed to and turns with the planet gear carrier 32 of the planetary gear drive 12. On the bearing bolts 34 of the planetary carrier 32, the planetary gears 36 are turnably secured. The planetary carrier 32 possesses further a clutch toothing 38 of a torque converter 40, with which the planetary gear carrier 32 is turnably affixed with a shaft housing 14, also possesses a clutch toothing 46, which, by means of a shifting element 48, can be brought into a rotatingly meshes with coupling toothing 38. Thereby, a bypassing of the planetary gears 12 is achieved. The planetary gears 36 mesh in their toothing both with the internal gear 10 as well as the sun gear 50, which is turnably affixed with a shaft 42. The shaft 42 possesses in part 18 of the housing 14, the rotor 52 of the electric motor 22. The stator 54 of the electric motor 22 is seated in the housing 14.

[011] Fig. 2 shows the arrangement in accord with Fig. 1, but with an additional brake retard device 56 in the form of a eddy current brake. Corresponding components are designated by the same reference numbers as in Fig. 1.

[012] The rotating part of the eddy current brake 56 are placed on the shaft 42 and the non-rotating elements are secured in part 20 of the housing 14. The brake retard system serves for a abrasion-free braking of the vehicle, especially where long downward inclines are concerned.

[013] Fig. 3 shows again the arrangement of Fig. 1, but with an additional overrunning clutch 58. Corresponding components as in Fig. 1 are designated with the same reference numbers. The rotating elements of the overrunning clutch 58 are placed on the shaft 8 and the non-rotating elements secured in part 20 of the housing 14. The overrunning clutch 58 serves for the drive of the vehicle powered by the electric motor 22, without the necessity that the drive source rotates.

[015] In Fig. 5 is shown an assembly with an overrunning clutch 59 on the input shaft 28 of the manual transmission 16. This overrunning clutch 59 supports the input shaft 28 against a reverse rotation, if, in vehicle stillstand, the drive source 4 is started from the electric motor 22.

Reference number and items

2	Drive system
4	Drive source
6	Fly-wheel
8	Shaft
10	Internal gear
12	Planetary gear drive
14	Housing
16	Manual transmission
18	Housing Part
20	Housing Part
22	Electric motor
24	Housing Part
26	Bearings
28	Input shaft
30	Bearings
32	Planetary carrier
34	Bolts for bearing
36	Planet gear
38	Toothing on gear
40	Bypass clutch
42	Shaft
44	Bearings
46	Clutch toothing
48	Shifting element
50	Sun Gear
52	Rotor
54	Stator
56	Brake retard
58	Overrunning clutch
59	Overrunning clutch

Claims

Claimed is:

1. An electrodynamic drive system (2) for a vehicle, located between a drive source (4) and a manual transmission (16) therein characterized, in that the drive system (2) possesses a planetary drive (12), which incorporates the three elements, namely, sun gear (50), internal gear (10) and planetary gear carrier (32), of which a first element (32) is connected to the manual transmission (16), a second element (10) is connected to the drive source (4) and the third element (50) is bound to at least one electric motor (22).

2. An electrodynamic drive system (2) for a vehicle in accord with Claim 1, therein characterized, in that a control is provided, which can regulate the at least one electric motor (22) in 4-quadrant operation.

3. An electrodynamic drive system (2) for a vehicle in accord with Claim 1 or 2, therein characterized, in that a shifting clutch (40) between two elements (32, 50) of the planetary drive (12) is provided for bypassing the planetary drive (12).

4. An electrodynamic drive system (2) for a vehicle in accord with Claim 3, therein characterized, in that the shifting clutch (40) includes a dog clutch.

5. An electrodynamic drive system (2) for a vehicle in accord with one of the Claims 1 to 4 therein characterized, in that between the drive source (4) and the electrodynamic drive system (2) an overrunning clutch (58) is provided.

6. An electrodynamic drive system (2) for a vehicle in accord with one of the Claims 1 to 5 therein characterized, in that an eddy current brake retard (56) is placed on a shaft (42) of the planetary drive (12).

7. An electrodynamic drive system (2) for a vehicle in accord with one of the Claims 1 to 6 therein characterized, in that a plurality of electric motors (22) upon one of the elements (50) act upon the planetary drive (12).

8. An electrodynamic drive system (2) for a vehicle in accord with one of the Claims 1 to 7 therein characterized, in that a blocking device is provided for the formation of a torque reinforcement during the start procedure of the drive source (4).

9. An electrodynamic drive system (2) for a vehicle in accord with Claim 8, therein characterized, in that the blocking device in the manual transmission (16) is made by the simultaneous engagement of two gear stages.

10. An electrodynamic drive system (2) for a vehicle in accord with Claim 8, therein characterized, in that the blocking device is formed by a parking lock.

11. An electrodynamic drive system (2) for a vehicle in accord with Claim 8, therein characterized, in that the blocking device is made by a braking apparatus of the vehicle and a simultaneously engaged gear stage of the shifting clutch (16).

12. An electrodynamic drive system (2) for a vehicle in accord with Claim 8, therein characterized, in that the blocking device is formed by an override clutch (59) on an input shaft (28) of the manual transmission (16).

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Fig. 1

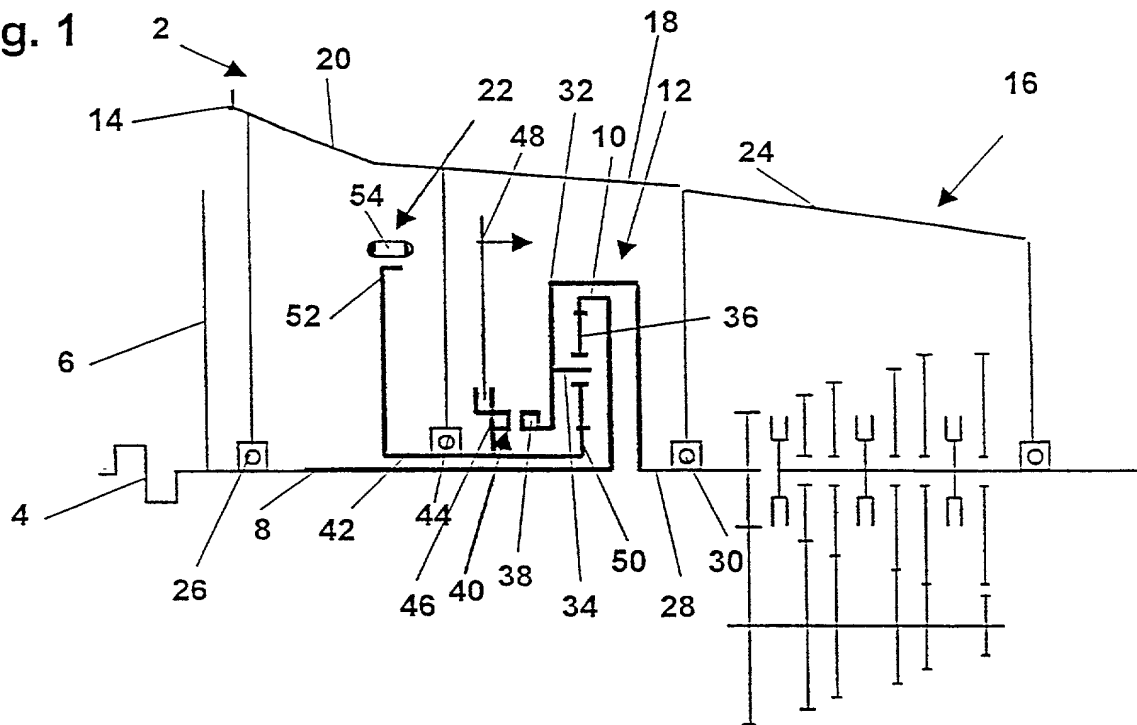


Fig. 2

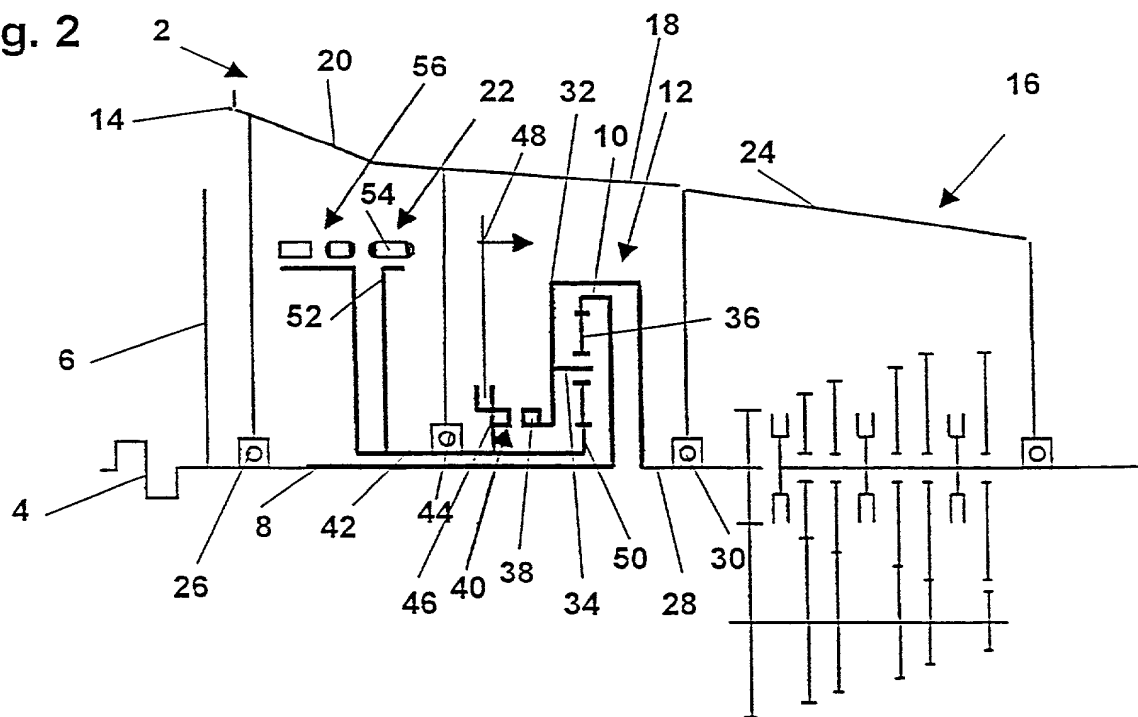


Fig. 3

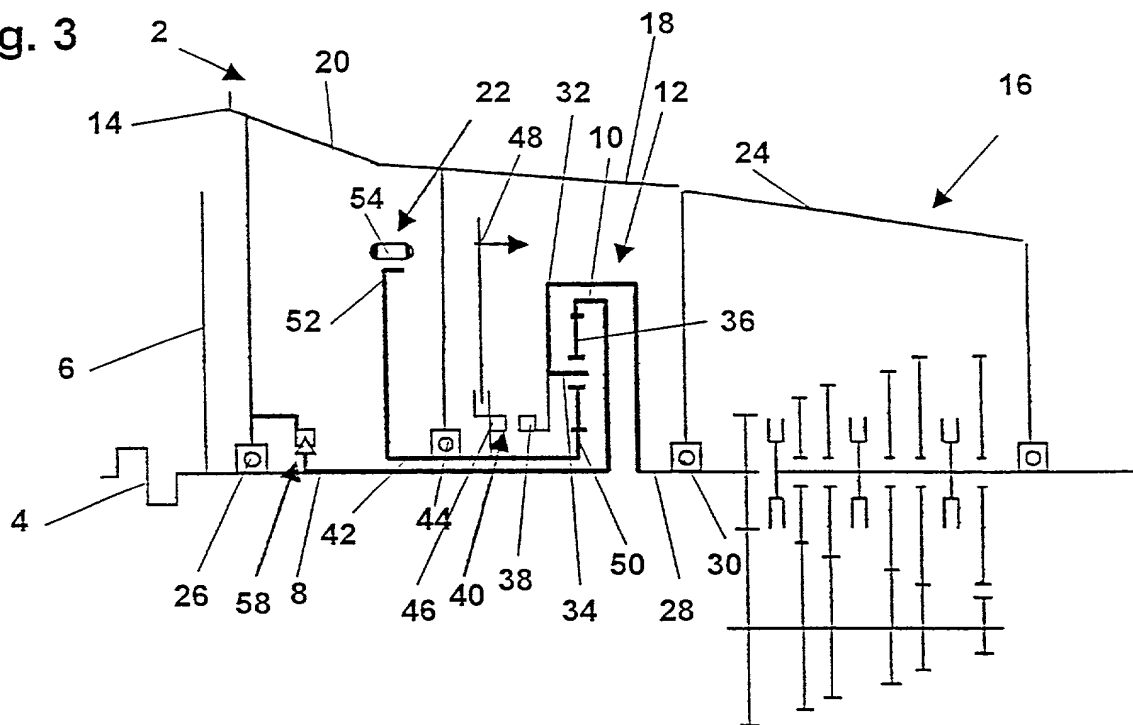
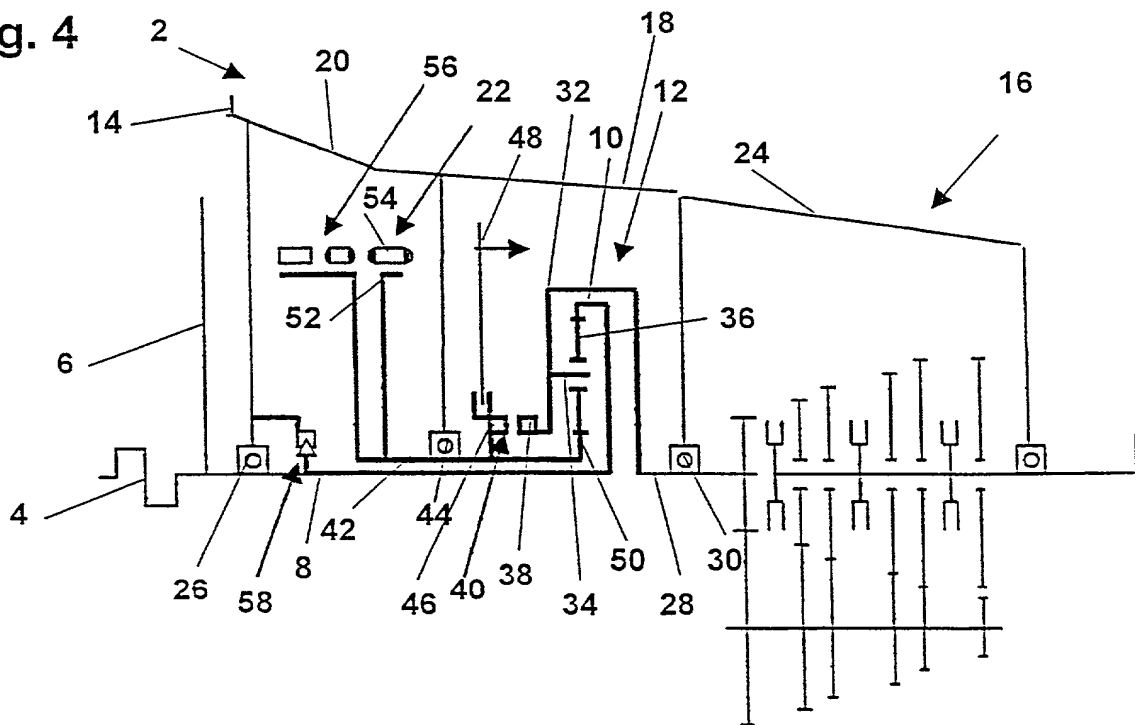
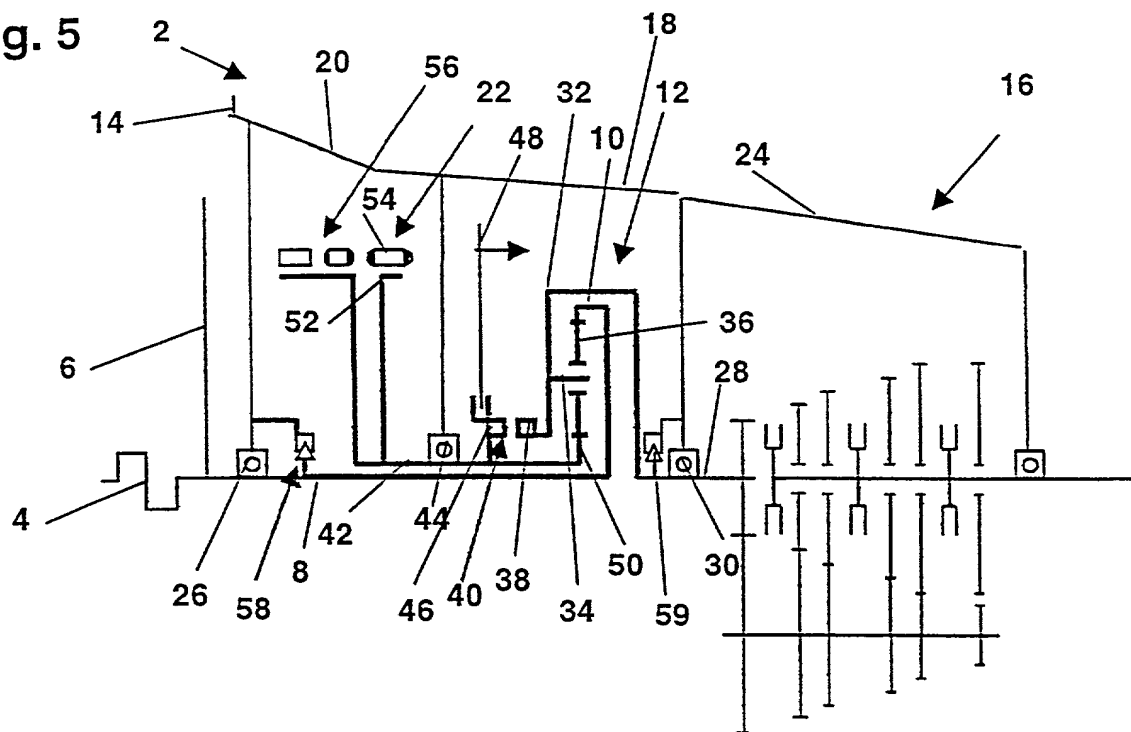


Fig. 4





COMBINED DECLARATION AND POWER OF ATTORNEY
(Original, Design, National Stage of PCT, Supplemental)

As a below named inventor, I hereby declare that:

TYPE OF DECLARATION

This declaration is of the following type: (check one applicable item below)

- original
design
supplemental
X National Stage of PCT
divisional (see added page)
continuation (see added page)
continuation-in-part (see added page)

INVENTORSHIP IDENTIFICATION

My residence, post office address and citizenship are as stated below next to my name. I believe that the original, first and sole inventor (*if only one name is listed below*) an original, first and joint inventors (*if plural names are listed below*) of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

TITLE OF INVENTION

ELECTRODYNAMIC DRIVE TRAIN

SPECIFICATION IDENTIFICATION

The specification of which: (complete (a), (b) or (c))

- (a) is attached hereto.
(b) was filed on _____ as " Serial No. _____
0 / _____ or " Express Mail No. _____ (as Serial
No. not yet known) _____ and was amended on _____ (if
applicable).
(c) **X** was described and claimed in PCT International
Application No. PCT/EP00/06764 filed on
15 July 2000 (15.07.2000) and as amended under PCT
Article 19 on _____ (if any).

POWER OF ATTORNEY

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name(s) and registration number(s))

3- Anthony G. M. Davis Registration No. 27,868
Michael J. Bujold Registration No. 32,018
Scott A. Daniels Registration No. 42,462

Attached as part of this Declaration and Power of Attorney is the authorization of the above-named attorney(s) to accept and follow instructions from my representative(s).

Send Correspondence to
Davis & Bujold, P. L. L. C.
Fourth Floor
500 N. Commercial Street
Manchester, NH 03101

Direct Telephone Calls to:
(603) 624-9220

Direct Telefaxes to:
(603) 624-9229

ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent Office all information which is known to be material to patentability of this application as defined in § 1.56 of Title 37 of the Code of Federal Regulations.

PRIORITY CLAIM

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

EARLIEST FOREIGN APPLICATION(S), IF ANY FILED WITHIN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION

COUNTRY	APPLICATION NO.	DATE OF FILING (day,month,year)	PRIORITY CLAIMED UNDER 37 USC 119
Fed. Rep. of Germany	199 34 696.8	(23.07.99) 23 July 1999	<input checked="" type="checkbox"/> YES NO
			YES NO
			YES NO
			YES NO
			YES NO

ALL FOREIGN APPLICATION(S), IF ANY FILED MORE THAN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signature(s)

Full name of sole ~~inventor~~ **Friedrich J. EHRLINGER**

Inventor's signature

Date **2001-10-05**

Country of Citizenship **Fed. Rep. of Germany**

Residence **Schienerbergweg 22, D-88048 Friedrichshafen, Germany** **DEX**

Post Office Address **c/o ZF Friedrichshafen AG, D-88038 Friedrichshafen, Germany**